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**DE ES FR GB IT NL SE**(71) Applicant: **INDUSTRIE ZANUSSI S.p.A.**  
**Via Giardini Cattaneo 3**  
**I-33170 Pordenone(IT)**(72) Inventor: **Vis, Benjamin**  
**Via Manin 9A/7**  
**I-33080 Prata, Pordenone(IT)**(74) Representative: **Patentanwälte Grünecker,**  
**Kinkeldey, Stockmair & Partner**  
**Maximilianstrasse 58**  
**W-8000 München 22(DE)**(54) **Refrigerator including a beverage dispenser.**

(57) In known refrigerators equipped with a beverage dispenser, one wall of the refrigerator housing is formed with a relatively deep recess for the accommodation therein of a cup to be filled with a beverage, and a dispenser nozzle or the like. The depth of this recess adversely affects the thermal insulation of the respective wall, and the recess itself gives rise to the accumulation of dirt.

According to the invention, a shallower recess is formed in a wall of the refrigerator housing, and closed by a manually operable closure flap which can be lowered to a use position in which it acts as a support for a cup of the like. The closure flap is operatively connected to a rotatable dispenser spout, so that the latter extends inside the recess when the flap is in the closed rest position, and projects outwards to a location above the closure flap when the latter is lowered to its use position.

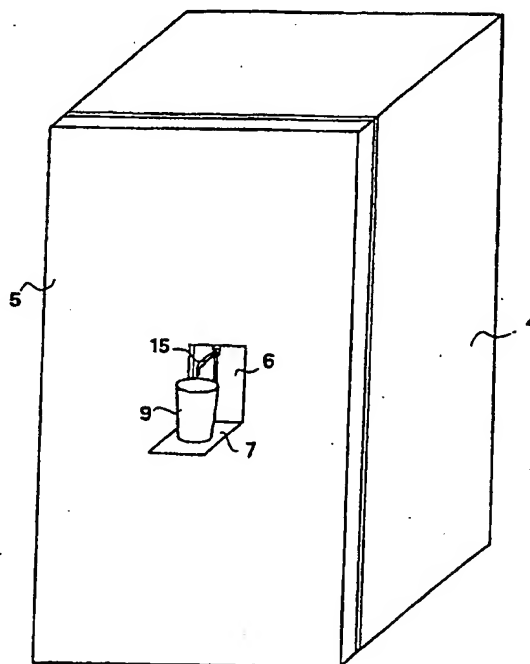


Fig. 1

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The present invention relates to a refrigerator, particularly of the domestic type, provided with a beverage dispenser. Refrigerators including beverage dispensers are generally known and may for instance be of a construction as described in EP-A-0 146 180. In particular, beverage dispensers of this type generally comprise a rechargeable or replaceable container for the beverages to be dispensed, this container being mounted on the inner wall surface of the door of the refrigerator, or in a recess formed in the door itself. Associated to the container is a manually operable valve for dispensing the beverage into a cup placed for space-saving reasons into a recess formed in the door of the refrigerator below the dispensing valve. For simplifying the use of the beverage dispenser without the necessity of opening the door of the refrigerator, it is preferred that the beverage is dispensed through the door to the outside thereof. This solution, which is described for example in US-A-3,934,757, provides that the recess for accommodating the cup and the dispensing valve is formed in the outer wall surface of the refrigerator door, while a suitable conduit extends through the door in a sealing fit for connecting the dispensing valve to the beverage container located within the refrigerator.

The recess is usually of the continually open type and therefore susceptible to the accumulation of dirt, which is objectionable from the hygienic viewpoint as well as for aesthetic reasons.

In any case, however, the main disadvantage of this solution results from the fact that the recess, which has to accommodate a cup or the like, has necessarily rather great dimensions with respect to the thickness of the door, so that the thermal insulation of the refrigerator is undesirably degraded.

It is therefore the main object of the invention to propose a refrigerator provided with a beverage dispenser which is accessible through a wall of the refrigerator without substantially affecting the thermal insulation properties and the external shape and dimensions of the refrigerator.

Another object of the invention is the provision of a refrigerator including a beverage dispenser of the type defined above, which is particularly comfortable in use and does not substantially affect the appearance of the apparatus.

According to the invention, these objects are attained by a refrigerator including a beverage dispenser and incorporating the characteristics set forth in the appended claims.

The characteristics and advantages of the invention will become more clearly evident from the following description, given by way of example with reference to the accompanying drawings, wherein:

fig. 1 shows a simplified perspective view of

a refrigerator according to the invention, with a beverage dispenser in the use position,,

fig. 2 shows a sectional sideview of an enlarged detail of the refrigerator of fig. 1 in the use position, and

fig. 3 shows a front view, with a closure flap omitted, of the detail of fig. 2 in the rest position.

With particular reference to the drawings, the refrigerator according to the invention basically comprises an enclosed housing 4 provided with an access door 5. The outer face of a wall of the refrigerator, preferably of door 5, is provided with a recess 6 at the bottom end of which a closure flap 7 is mounted on a shaft 8. In the vertical rest position of closure flap 7, recess 6 is completely obturated, while closure flap 7 extends preferably coplanar with the outer surface of door 5. Closure flap 7 is adapted to be manually lowered outwards to a substantially horizontal position as shown in figs. 1 and 2, for the support thereon of a cup 9 or the like.

Shaft 8 is non-rotatably connected to closure flap 7 and carries at an intermediate location a likewise non-rotatably fixed bevel gear 10 meshing with another bevel gear 11.

The latter is non-rotatably secured to a substantially vertical transmission shaft 12 the upper end of which is secured to a cylindrical head portion 13 located adjacent the upper end of recess 6. The upper end of cylindrical head portion 13 is sealingly received in a freely rotatable manner in a head socket 14. The lower part of head portion 13 is provided with a substantially horizontal dispenser spout 15 which in the rest position shown in fig. 3 extends substantially parallel to the wall surface of door 5, while in the use position depicted in figs. 1 and 2, it extends outwards of recess 6 above cup 9.

Head socket 14 is formed with an internal cavity 16 communicating by way of a conduit 17 extending in a sealed manner through refrigerator door 5 and preferably provided with a solenoid valve 18 or the like, with at least one beverage container (not shown for the sake of simplicity, but located at an elevated position within the refrigerator). Solenoid valve 18 is of the normally closed type and operable to open by means for instance of a push-button switch 19 connected to an electric voltage source (not shown).

Cylindrical head portion 13 is internally formed with a passage 20 connecting cavity 16 to dispenser spout 15. In the non-operative state of the appliance, closure flap 7 is in its closed position coplanar with the outer surface of door 5, so that recess 6 is completely covered, and there are no projecting parts of the dispenser. As in fact shown

in fig. 3, dispenser spout 15 extends only within recess 6 substantially parallel to the outer face of door 5.

When closure flap 7 is manually opened by lowering it outwards, the resulting rotation of shaft 8 and thus of bevel gear 10 is transmitted via bevel gear 11 to transmission shaft 12 and its cylindrical head portion 13. When closure flap 7 is thus lowered to the substantially horizontal position shown in figs. 1 and 2, dispenser spout 15 is at the same time rotated to its use position in which it projects outwards of recess 6 above closure flap 7. The latter may have a mechanical abutment stop 21 associated therewith for defining its substantially horizontal use position, in which it acts as a suitable support plane for a cup 9 or the like placed below the outlet end of dispenser spout 15. The user may then operate push-button switch 19, which may be connected to a not shown metering device of a per se known type, to thereby open solenoid valve 18; so that the beverage is dispensed through pipe 17, cavity 16 of head socket 14, passage 20 and dispenser spout 15.

In contrast to known solutions, in which a cup or the like has to be placed inside a corresponding recess, it is noted that according to the present invention the required recess may have rather small dimensions, particularly as regards its depth. As a matter of fact, the depth of recess 6 needs just be sufficient for the accommodation of dispenser spout 15 in its rest position, of head socket 14, cylindrical head portion 13, transmission shaft 12 and bevel gears 10 and 11. It will be obvious that, as seen in the direction of depth, all of these components require a particularly reduced space (of for instance just 1 cm), so that the wall of the refrigerator in which recess 6 is formed may advantageously be provided, within the limits of its thickness, with a thermal insulation which is not substantially affected by the formation of the recess.

The described refrigerator may of course undergo various modifications within the purview of the invention. Different constructions may thus be selected for the various mechanical transmission components 10 to 12, for the liquid connection components 16, 17, 20 and/or for the control components 18 and 19 of the beverage dispensing operation.

#### Claims

1. A refrigerator including a beverage dispenser, comprising at least one beverage container accommodated within the refrigerator and adapted to supply a respective beverage through a conduit extending through a wall of the refrigerator, to a dispenser spout located in

a recess formed in the outer face of the respective wall, characterized by further comprising a closure flap (7) hingedly mounted adjacent the bottom end of said recess (6) and adapted to be manually displaced between a substantially vertical rest position, in which it obturates said recess, and a substantially horizontal use position in which it projects outwards from said refrigerator (4) to act as a support for a cup (9) or the like, said dispenser spout (15) being rotatable about a substantially vertical axis and connected to said closure flap by mechanical transmission means (10,11,12) for being rotated between a first position, in which it extends inside said recess (6), and a second position, in which it projects outwards from said refrigerator to a position above said cup (9), when said closure flap (7) is in said rest position and use position, respectively.

2. A refrigerator including a beverage dispenser according to claim 1, comprising manually operable control means for the beverage dispensing operation, characterized in that said control means (19) is located adjacent to or within said recess (6).

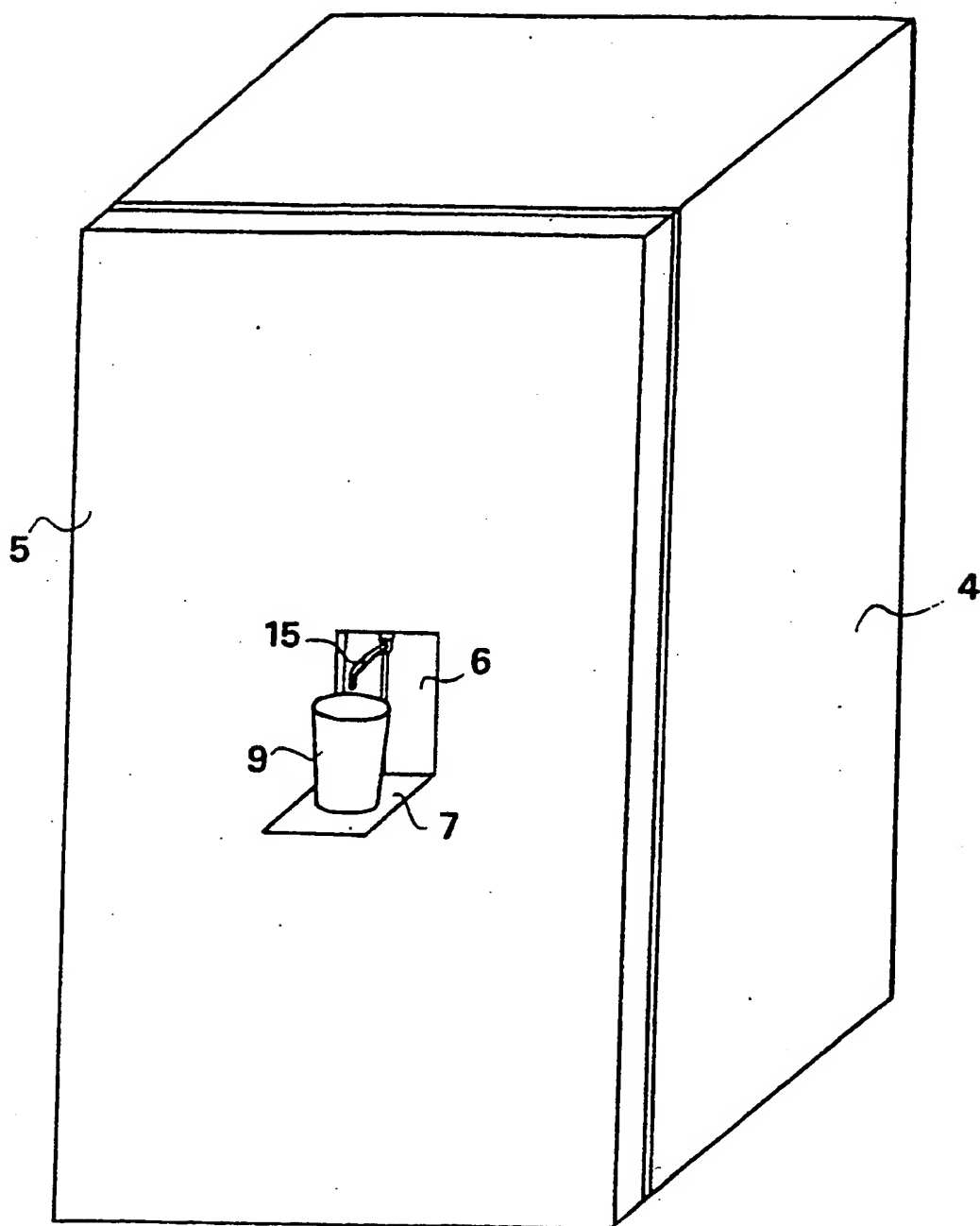
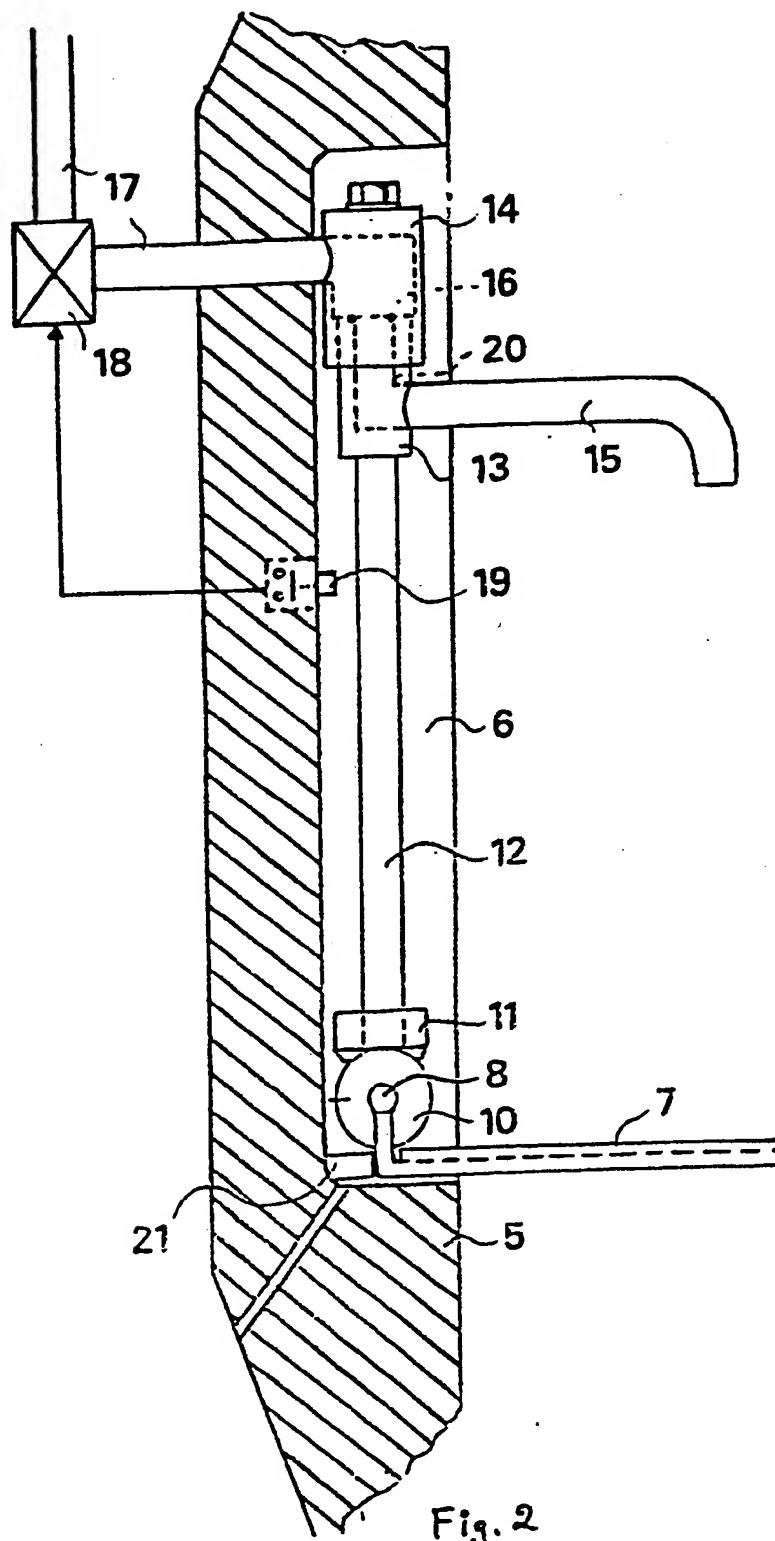


Fig. 1



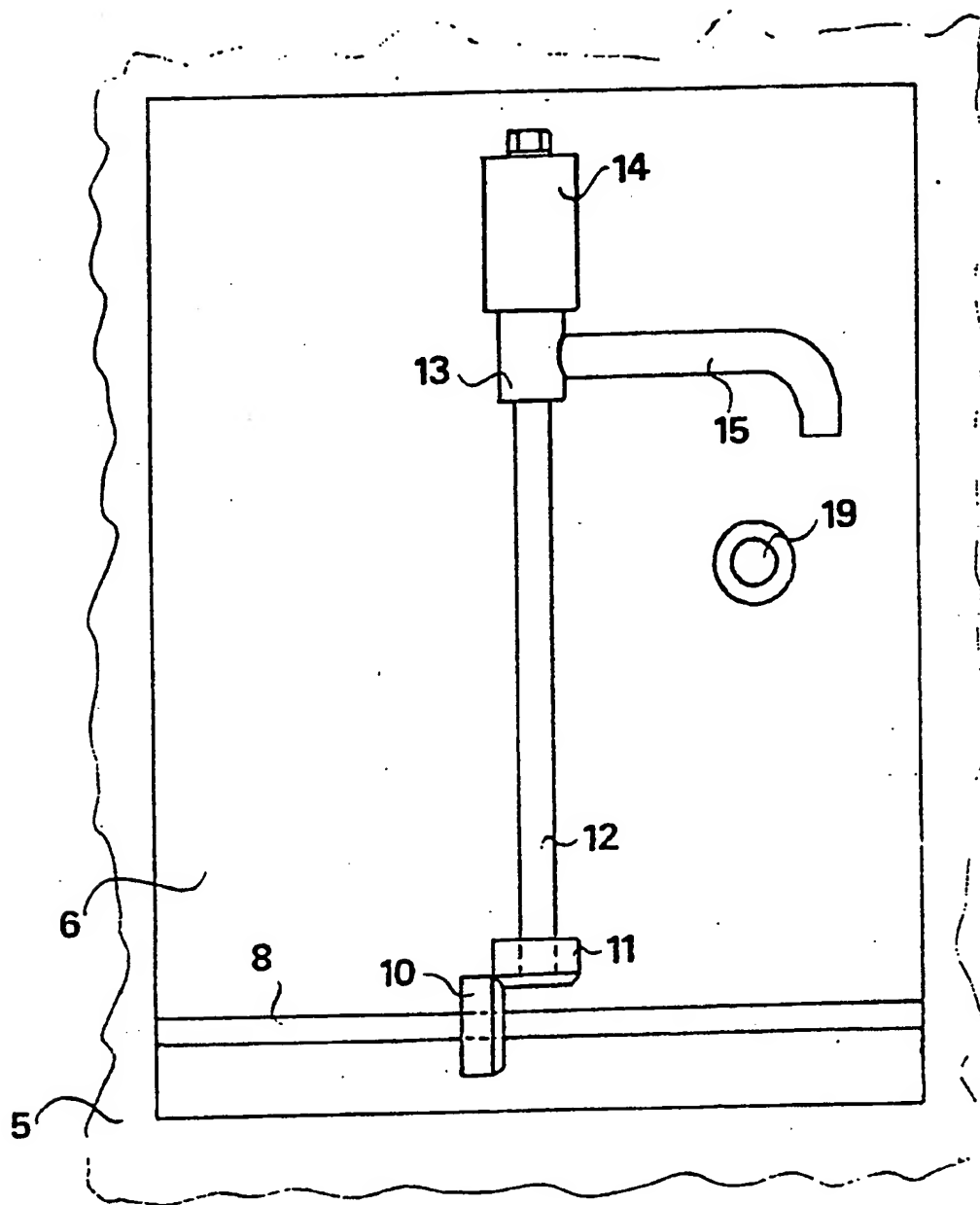


Fig. 3